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NOTICE OF ALLOWANCE AND FEE(S) DUE

47390 7590 06/17/2009

THOMAS, KAYDEN, HORSTEMEYER & RISLEY LLP
600 GALLERIA PARKWAY, 15TH FLOOR
ATLANTA, GA 30339

EXAMINER

SPIELER, WILLIAM

ART UNIT

PAPER NUMBER

2159

DATE MAILED: 06/17/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,410

04/08/2004

Yi-Cheng Liu

252011-2200

7813

TITLE OF INVENTION: PROCESS SCHEDULING SYSTEM AND METHOD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	09/17/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

47390 7590 06/17/2009

THOMAS, KAYDEN, HORSTEMEYER & RISLEY LLP
600 GALLERIA PARKWAY, 15TH FLOOR
ATLANTA, GA 30339

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,410	04/08/2004	Yi-Cheng Liu	252011-2200	7813

TITLE OF INVENTION: PROCESS SCHEDULING SYSTEM AND METHOD

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nonprovisional	NO	\$1510	\$300	\$0	\$1810	09/17/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
SPIELER, WILLIAM	2159	718-100000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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10/820,410	04/08/2004	Yi-Cheng Liu	252011-2200	7813
47390	7590	06/17/2009	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY LLP 600 GALLERIA PARKWAY, 15TH FLOOR ATLANTA, GA 30339			SPIELER, WILLIAM	
			ART UNIT	PAPER NUMBER
			2159	
DATE MAILED: 06/17/2009				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 953 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 953 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/820,410	LIU, YI-CHENG	
	Examiner	Art Unit	
	WILLIAM SPIELER	2159	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Telephonic interview of 12 June 2009.
2. ☒ The allowed claim(s) is/are 1-3, 6, 8-10, 13, 15-17, 20 (renumbered 1-12).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date ____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date ____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other ____. |

/William Spieler/
Examiner, Art Unit 2159

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Applicant's Representative, Daniel R. McClure, Reg. No. 38,962, on 12 June 2009.

The application has been amended as follows:

1. (Currently Amended): A process scheduling system to schedule processes on an application system, comprising:

a plurality of configurations comprising at least one resource item and at least one process of the application system, wherein ~~the~~ at least one resource item comprises a central processing unit (CPU) ~~and~~ or a disk of the application system;

a fetch module to fetch resource status data of the resource item, ~~wherein the resource status data comprises data for the CPU use rate and data for the disk use rate;~~

a timing scheduling module to use a neural network model to determine an execution time point for the process according to the resource status data, ~~wherein the CPU use rate, the disk use rate and a peak time interval are adopted as processing elements of the neural network model, and the resource status~~

data is fed to the neural network model for calculating the execution time point for the process; and

a trigger module to determine whether the execution time point for the process is present, and execute the process at the execution time point when the execution time point for the process is present.

8. (Currently Amended): A process scheduling method to schedule processes on an application system, comprising the steps of:

fetching resource status data of at least one resource item of the application system, wherein ~~the~~ at least one resource item comprises a central processing unit (CPU) ~~and or~~ or a disk of the application system, ~~and the resource status data comprises data for the CPU use rate and data for the disk use rate;~~

determining an execution time point for at least one process according to the resource status data using a neural network model, ~~wherein the CPU use rate, the disk use rate and a peak time interval are adopted as processing elements of the neural network model,~~ and the resource status data is fed to the neural network model for calculating the execution time point for the process;

determining whether the execution time point for the process is present;
and

when the execution time point for the process is present, executing the process at the execution time point.

15. (Currently Amended): A machine-readable storage medium storing a computer program which, when executed, directs a computer to perform a process scheduling method to schedule processes on an application system, comprising the steps of:

fetching resource status data of at least one resource item of the application system, wherein ~~the~~ at least one resource item comprises a central processing unit (CPU) ~~and or~~ or a disk of the application system, ~~and the resource status data comprises data for the CPU use rate and data for the disk use rate;~~

determining an execution time point for at least one process according to the resource status data using a neural network model, ~~wherein the CPU use rate, the disk use rate and a peak time interval are adopted as processing elements of the neural network model,~~ and the resource status data is fed to the neural network model for calculating the execution time point for the process;

determining whether the execution time point for the process is present;
and

when the execution time point for the process is present, executing the process at the execution time point.

2. The following is an examiner's statement of reasons for allowance:

The "execution time point" as claimed is understood by Examiner to refer to a particular, discrete and absolute point in time, as opposed to an abstractly-future or relative point in time. The prior art teaches two related tools in scheduling the execution

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of a process: (1) a queue and (2) time-slicing that are relevant to the instant invention (other techniques such as priority-based scheduling, weighted scheduling are not relevant and are not discussed here).

Prior art scheduling algorithms using a queue use resource status data in determining the insertion point in the queue for the process being scheduled. However, such a queue merely indicates a particular order in which processes are to be executed; although this does produce a time-based ordering of execution of processes, the particular time that a process will execute is not determined in an absolute manner at the time of scheduling; processes in a queue may execute for an arbitrary time period, thereby causing the time at which processes lower in the queue are executed to be relative to the time taken in executing higher-queued processes. In a queue-based scheduling system, the execution time point is not determined at the point of scheduling: a claimed feature of the timing scheduling module of Claim 1, which is recited in substance in Claim 15 as well.

Prior art scheduling algorithms using time-slicing generally begin the execution of a process at a particular time. These applications of time-slicing, however, do not specify that a particular process is to be given a particular time-slice. The scheduler chooses which process to run at the *termination* of a time-slice; that is, whereas the instant invention will schedule a process to execute at a particular point in the future, the prior art reaches a particular time, and then chooses which process to execute. This is patentably distinct from the scheduling method claimed in the instant invention.

More significantly, however, time-slicing methods in the prior art teach away from the instant invention in that when a process executing during a time slice – if it is I/O blocked, if it has finished, etc. – the next process immediately starts running. This teaches away from the instant invention in that the time of execution is not scheduled as a specific, concrete value at the time of scheduling, but rather a relative value.

What particularly comprises the resource status data evaluated by the neural network model scheduling module is not the point of novelty or non-obviousness, and is removed in this Examiner's Amendment so as to avoid 35 U.S.C. § 112 ¶¶ 1-2 issues that have arisen in the course of prosecution with respect to the meaning of the term "disk use rate." Examiner notes, however, that sufficient disclosure exists to not include this element in the claims given, at the very least, its non-inclusion in the independent claims as originally filed; although the allowed claims are broader than those presented in the claims filed 11 November 2008, the amendments do not constitute new matter under 35 U.S.C. § 112 or 37 C.F.R. § 1.121(f).

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM SPIELER whose telephone number is (571)

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270-3883. The examiner can normally be reached on Monday to Thursday, 11 AM - 5 PM Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Trujillo can be reached on (571) 272-3677. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William Spieler/
Examiner, Art Unit 2159

/James Trujillo/
Supervisory Patent Examiner, Art
Unit 2159